

Tactile Communications

Completed Technology Project (2013 - 2013)



Project Introduction

Communication with the crew is vital and must be maintained regardless of environmental conditions and crew activity. Current spacecraft communication systems depend entirely on visual and auditory channels that can be unavailable or unreliable when the crew is sleeping, fully engaged in another activity, or in a noisy environment. Tactile information displays provide a highly reliable alternative that takes advantage of the most salient human sense – touch. This additional interface modality can be used for a wide range of interactions, including emergency caution and warning, non-emergency situational awareness, navigation, and to enhance realism in telepresence and virtual training. The project team will partner with University of Minnesota Apparel Design students to develop wireless tactile communication garments that can be used to evaluate various tactile display methodologies.

This project has developed a set of tactile display garments that will be used to evaluate various tactile display methodologies. The garments include two sleeves and a belt that are designed for easy don/doff to facilitate research with multiple users. Fifteen small vibrating motors are integrated into the garments and are controlled wirelessly via a custom desktop control interface.

Anticipated Benefits

Communication with the crew is vital and must be maintained regardless of environmental conditions and crew activity. Current spacecraft communication systems depend entirely on visual and auditory channels that can be unavailable or unreliable when the crew is sleeping, fully engaged in another activity, or in a noisy environment. Tactile information displays provide a highly reliable alternative that takes advantage of the most salient human sense – touch. This additional interface modality can be used for a wide range of interactions, including emergency caution and warning, non-emergency situational awareness, navigation, and to enhance realism in telepresence and virtual training.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

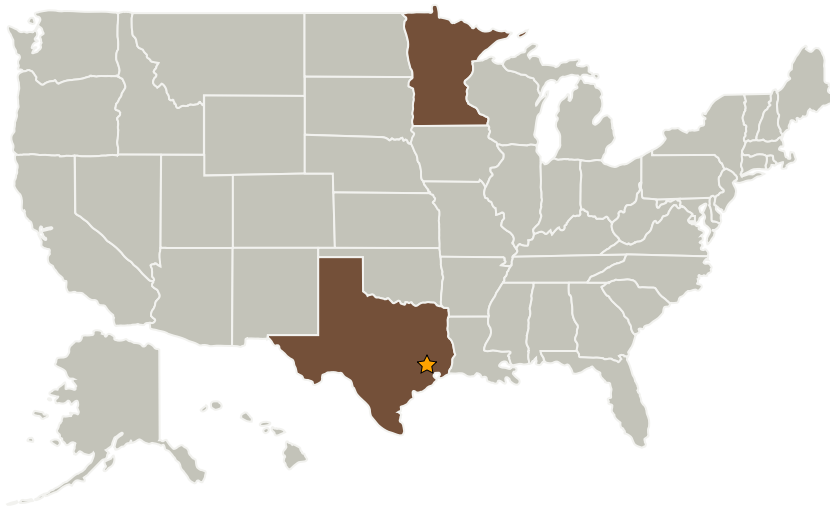
Center Innovation Fund: JSC CIF

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
University of Minnesota-Twin Cities	Supporting Organization	Academia	Minneapolis, Minnesota

Primary U.S. Work Locations

Minnesota	Texas
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Project Management

Program Director:

Michael R Lapointe

Program Manager:

Carlos H Westhelle

Project Manager:

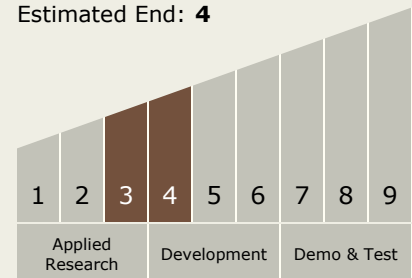
Cory L Simon

Principal Investigator:

Cory L Simon

Technology Maturity (TRL)

Start: **3**
Estimated End: **4**



Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
 - └ TX13.4 Mission Success Technologies
 - └ TX13.4.2 Team Preparedness and Training



Images



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(<https://techport.nasa.gov/image/2203>)